

*BELL WORK*

*11-May-2017*

**What is the charge  
on each of the  
following atoms in  
 $\text{C}_2\text{H}_2$ ?**

# *Agenda*

**What's a redox reaction**

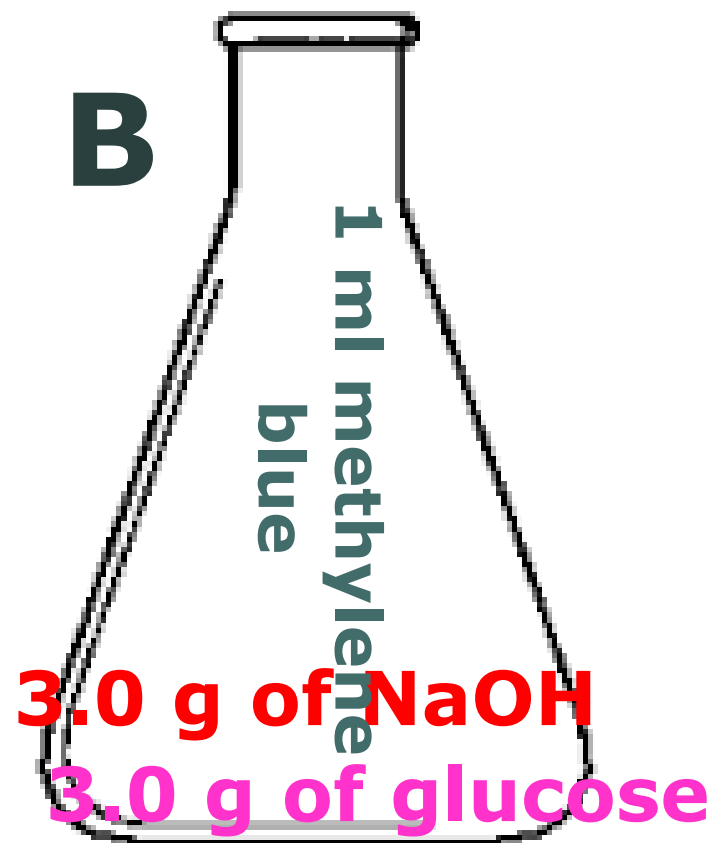
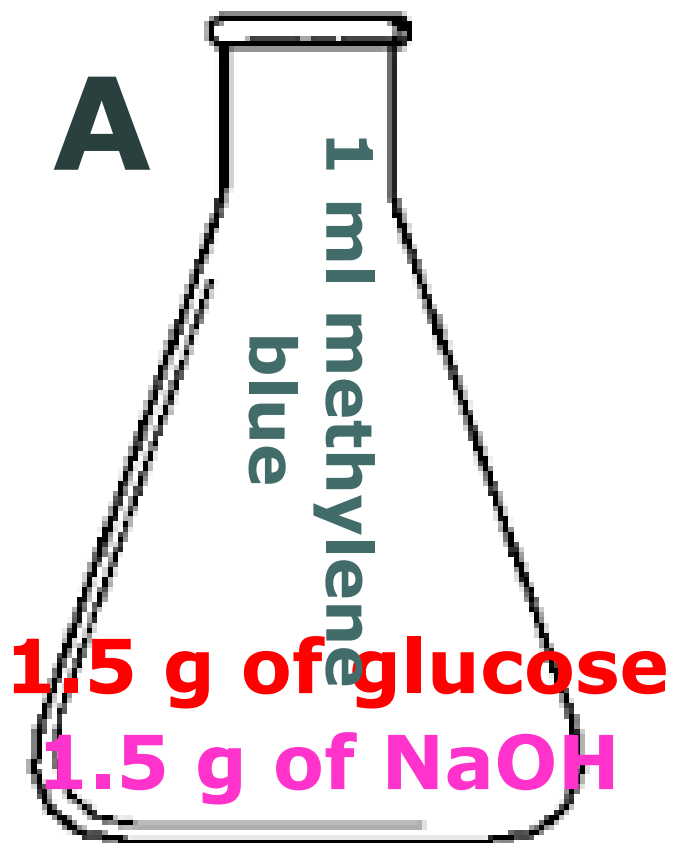
☺...

## *Objective*

**You will know what a redox reaction is and understand why the inspection method of balancing does not work.**



# *Color Change Oxidation*



# *Redox Rxn*

Redox rxns, or **oxidation reduction reactions**, have a number of similarities to acid-base rxns.



**Fundamentally, redox rxns are a family of rxns that are concerned with the transfer of electrons between species.**

# *Determining Oxidation Numbers*

## **Is it...**

- 1. An element = 0**
  - 2. Group 1 metal? = +1**
  - 3. Group 2 metal? = +2**
  - 4. Hydrogen = +1 with nonmetals, -1 with metals**
  - 5. Fluorine = -1**
  - 6. Oxygen, usually -2 unless peroxide ( $X_2O_2$ , where X=Group 1 metal).**
- Sum of Oxi#s of neutral compound = 0**
- Sum of Oxi#s of polyatomic ion = charge**

# *You Think You Know Your Stuff*

Try to balance this one by inspection:



There is also another method...  
called the Half Reaction  
method **BUT HOLD ON**  
**WE'RE** not there yet

# *Oxidation Number*

The charge that atom would have if the compound was composed of ions

The oxidation # of an atom is zero in a elemental substance:

**Na, Cu, Ag, Fe etc.**

and zero in the seven diatomic elements:

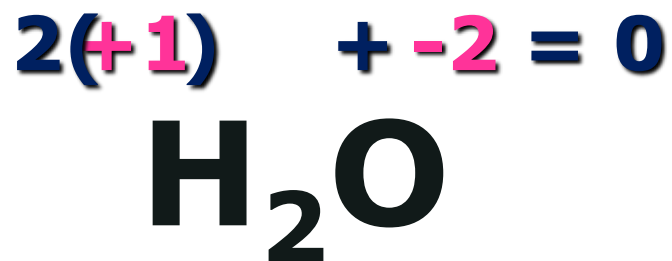
**H<sub>2</sub>, N<sub>2</sub>, O<sub>2</sub>, F<sub>2</sub>, Cl<sub>2</sub>, Br<sub>2</sub>, I<sub>2</sub>**

# *Oxidation Number*

The oxidation number of simple ions is equal to the charge on the ion.

Na<sup>+</sup> ion is ... **+1**

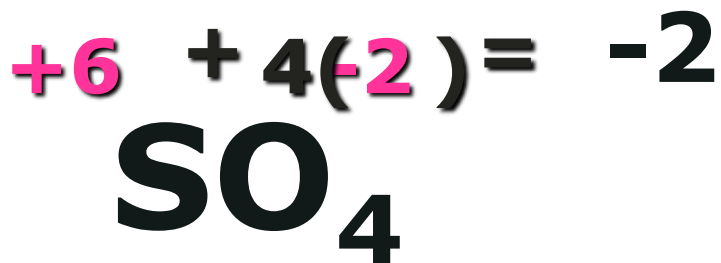
The sum of the oxidation numbers in a neutral compound is zero.





# *Oxidation Number*

The sum of the oxidation numbers in a polyatomic ion is equal to the charge on the ion.



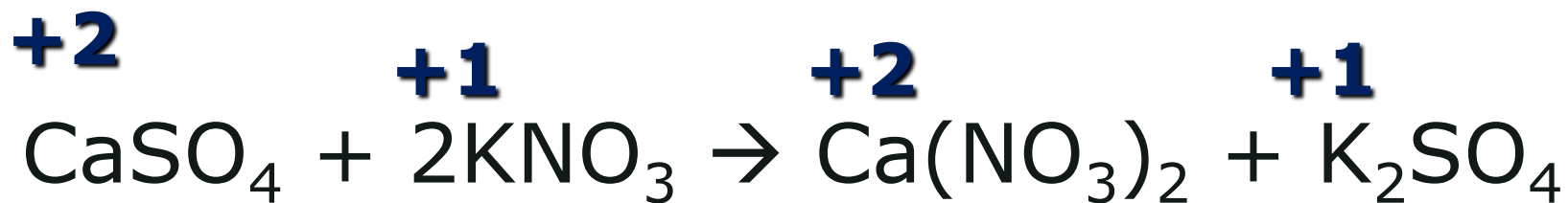
*Try these...*

Give me the oxidation number of the  
all the following atoms in the  
compounds:



# *In a Reaction*

What are the oxidation numbers of the cations in each of the elements in the rxn below?



# *What is Reduction?*

**The decrease in oxidation state  
(gain of electrons):**



# *What is Oxidation?*

**The increase in oxidation state  
(loss of electrons):**



# *Recall From Reading*

Which of the following is a redox reaction?



Identify what is being reduced

# *Guide for Writing & Balancing Half-Rxn Equations*

- 1. Identify the key elements that undergo oxidation state change.**
- 2. Split into two half rxn's**
- 3. Balance the number of atoms of the key element on both sides of both half rxns.**

# *Balancing Half-Rxn Equations*

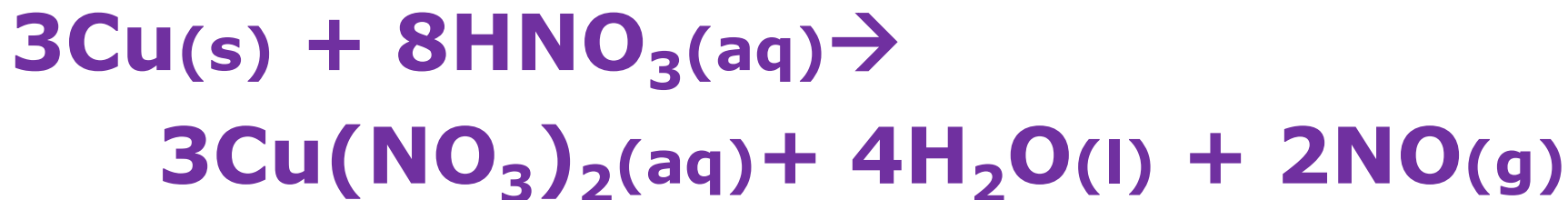
3.

- a. Balance elements other than H and O
- b. Balance O by adding  $\text{H}_2\text{O}$
- c. Balance H by adding  $\text{H}^+$
- d. Balance charge by adding  $\text{e}^-$



## *Practice From Reading*

Identify the oxidized and reduced elements then split into half rxns **DO NOT BALANCE** unless you think you have the stuff!



◆ <http://www.wisc-online.com/Objects/ViewObject.aspx?ID=GCH7804>

<http://www.sciencegeek.net/APchemistry/APtaters/Redox/>

“Step By Step”